

FIELD EXCURSION TO THE MINES OF EASTERN DARTMOOR, 7TH JANUARY 1993

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INTRODUCTION

In contrast to the classical tin and base metal hydrothermal vein systems of the Cornubian province, the envelope of folded sedimentary and volcanic rocks around the eastern part of the Dartmoor Granite hosts stratiform ore deposits of two contrasting types, that form the main subject of this excursion. Both examples of stratiform mineralisation visited, the magnetite skarn at Haytor Vale, and the manganiferous beds at Daddiscombsleigh are situated in Lower Carboniferous strata and are representative of similar deposits that occur sporadically in rocks of the same age from the Teign Valley of south Devon to east Cornwall.

After departure from the conference accommodation at Dartington Hall at 09.00, the party travelled through Bovey Tracey to Shott's Bottom near Haytor Vale

HAYTOR IRON MINE

Disused mine workings at Haytor Vale show the most extensive exposures in the group of stratiform iron ore deposits situated to the east of the village of Ilsington, Bovey Tracey, Devon. Both opencast and drift mining for magnetite and other iron ores, were pursued in the 19th and early 20th centuries and records indicate the production of 'lode stones' in the 16th century or earlier.

Haytor Iron Mine [SX 773 772] is situated within the metamorphic aureole of the Dartmoor Granite, with the contact lying some 500 m to the east. The ores are hosted conformably in metapelite probably of Lower Carboniferous (Dinantian) age. At adit level, the ore occurs in three beds which dip 30° to 35° north-east. Total thickness of the ore zone is 11.5 m and this includes 4.3 m of barren metapelite. A high-angle fault, apparently trending north-east and visible in the adit, throws the ore-bearing strata on the eastern side into contact with a barren metamorphosed sandstone/shale sequence of the Upper Carboniferous (Namurian) Crackington Formation.

The ore consists of finely intergrown magnetite and hornblende which may be massive, or show banding marked by varying proportions of the two minerals. Coarse hemioctahedra of magnetite are present on some joint surfaces and the hornblende forms coarse fibro-radiate aggregates in places. Locally, sparse discontinuous layers and irregular pockets of coarse garnet (andradite) crystals occur. Minor axinite, siderite, calcite and apatite are present, and pseudomorphs of chalcidony after datolite, originally termed 'Haytorite', have been recorded. Traces of sulphides are present in the ore beds and include arsenopyrite, pyrite, sphalerite and chalcopyrite.

The paragenesis of this deposit is typical of infiltration exoskarns elsewhere in the region, with an early thermal metamorphic phase of silicate growth succeeded by the development of ore minerals from high temperature hydrothermal fluids. Garnet is the earliest silicate, with two growth stages of slightly different composition separated by a regressive episode. The main growth of hornblende immediately postdates garnet, though some amphibole is present as inclusions, particularly in the later garnet. Hornblende is also present as impregnations in the wallrock and in reaction veins in a narrow and irregular pre-skarn aplite sill emplaced within the ore zone. Magnetite overgrows hornblende and fills fractures and joints within the orebodies. The latest

stage of mineralisation is the development of small pods and fracture fillings of sulphides, carbonates and chalcidony quartz.

The party entered the workings through the adit and examined sections showing typical ore assemblages and textures at that level.

Lunch was taken at the New Inn, Bridford, after which the party paid a brief visit to the site of the former Wheal Exmouth [SX 8376 8302], at Ashton, where lead, silver and zinc were worked from hydrothermal veins that trend north-south. The dumps at this locality yield specimens of galena, sphalerite, tetrahedrite, pyrite and siderite, with abundant quartz and barite. The veins are hosted in Lower Carboniferous chert and shale of the Teign Chert Formation.

The excursion then travelled on to Woodah Farm, Daddiscombsleigh.

SCANNICLIFT COPSE MINE

In the middle Teign Valley, patchy impersistent manganese ores are present within the Lower Carboniferous Teign Chert, apparently conformable with the host formation. The deposits occur as beds and nodules interbedded with the cherts and as impregnations in the chert

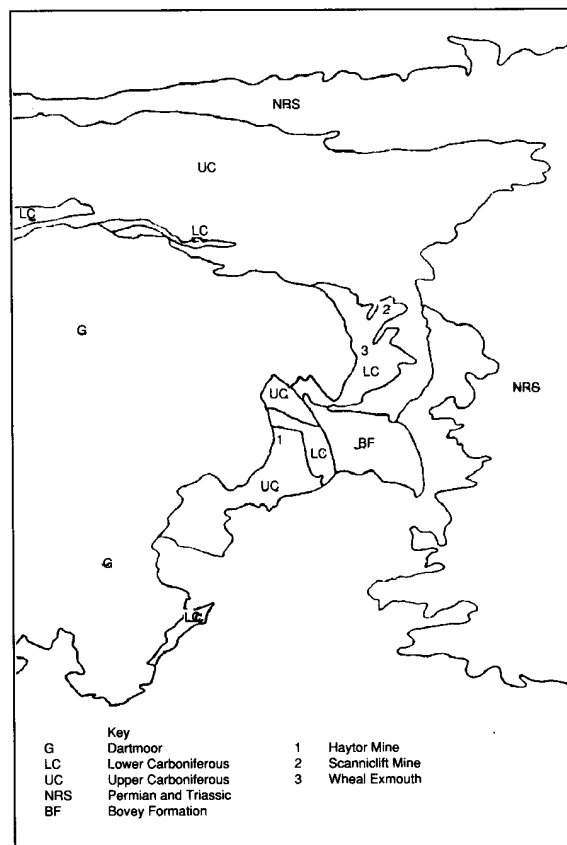


Figure 1. Geological map and location of sites.

bands and associated spilitic lavas and basic tuffs. The ores were worked in the Christow, Ashton and Doddiscombsleigh areas mainly between c 1810 and 1875. There are no records of output from the mines, but the quantity of ore raised is unlikely to have been large, since all the workings are of limited size and very shallow. The manganese concentrates were initially used to decolourise glass, later as a reagent in the manufacture of bleach, and finally in the manufacture of steel.

In Scanniclift Copse [SX 8442 8624 to 8447 8636] near Woodah Farm, manganese ore occurs within the Teign Chert over a strike length of c.550 m, this is the site of the former Teign or Scanniclift Copse Mine. Remains of these workings comprise small surface excavations along the length of the deposit, together with a gunniss, which shows an orebody conformable with the strata and dipping at about 45° to the south-east. The host rocks are spilitic lavas and cherts.

Fragments recovered from the dumps show crudely banded, in places brecciated ore composed of rhodochrosite and siliceous material, much replaced by, and veined with, manganese oxide minerals. Blocks of siliceous red rock, of jaspery aspect are common on the dumps.

The texture of the ores and their spatial association with spilitic basalt, cherts and hydrothermal brecciation suggests a syngenetic origin in an exhalative hydrothermal system. It is suggested that the manganese was deposited on or near the sea-floor from fluids associated with contemporaneous basic igneous activity.

After taking tea at Woodah Farm, kindly provided by Mrs. D. G. Taylor, the party dispersed.

This report is published with the approval of Director, British Geological Survey (NERC).

GEOLOGICAL SOCIETY SOUTH WEST REGIONAL GROUP

Forthcoming Events

21st September 1993

'Sediment movement and channel migration, the Camel Estuary, Padstow, Cornwall' by Dr Derek Laming

Venue: Exeter

16th October 1993

Field visit to the Perran iron Lode, North Cornwall led by Colin Sparrow

10th November 1993

'Regeneration of degraded muddy or sandy coasts' by Bob Kirby Venue: Plymouth

December 1993 (*date to be arranged*)

Progress Reports on RIGS (Regionally Imported Geological Society) in Cornwall, Devon, Somerset and Dorset

Venue: Exeter University

21st January 1994

Annual General Meeting

Venue: Dartmoor Lodge, Ashburton

For details of meetings contact:

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